

Thales **Turntable**



TTT-Compact: Thales turntable with battery drive

The extraordinary design and performance of our tangential pivoted tonearm Simplicity (which has become world standard), required a fitting turntable. The compact Thales turntable with battery-drive-system (TTT-Compact) is made to match the Simplicity tonearm perfectly in all aspects: technically, optically and tonally. It provides the most accurate and harmonic sound possible, in a compact and sublime design never seen before.

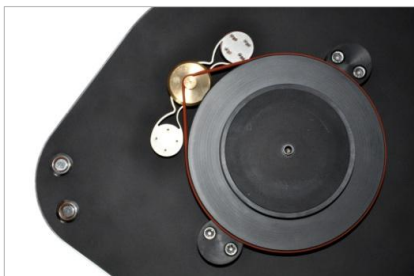
Concept



Based on the experience that a turntable with its tonearm should be one single unit, we have designed our own turntable which is manufactured in our workshop piece by piece and meets highest requirements. We are convinced about the sublime and compact design can provide mechanical stability which could never be reached by a more extensive concept. Each of the 100 parts has been carefully designed to perform its function in the overall concept perfectly. In

this documentation we will show you some details of the technical design. But please remember the final result is not the outcome of sophisticated details only, but the performance of the whole unit as an ensemble.

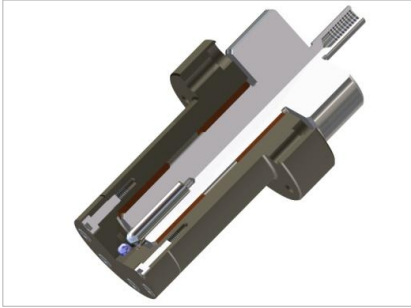
Drive



The drive of a turntable is basically very easy: it should make the record turning with a speed of 33 $\frac{1}{3}$ resp. 45 rpm. The list of what it should not do is much longer: it should not sound or vibrate at all. It should not be influenced by the mechanical tracking, no matter in which frequency-range. It should not care about temperature, humidity or dust. And finally it should be incredible constant. The human hearing

can discern 1Hz difference at its most sensitive frequency (1000 Hz). If we would have to define one hour that accurate, we should keep a pitch of less than four seconds! For the TTT, we have realized a drive system combining the advantages of the very traditional idle wheel drive (strength and constancy) with the benefit of the belt drive (silence and decoupling). The motor itself – a brushless DC motor with ironless winding – provides a maximum output of 20 Watts and is mounted on a carefully calculated decoupling element. This element keeps away all vibration from the chassis, but avoids any axial movement of the motor. The pulley – which acts as a flywheel to compensate the motor increments – drives the sub-platter via a precision-belt, originally made for medicine applications. The whole drive system is completely covered by the platter.

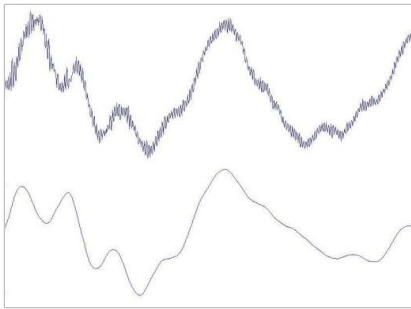
Bearing



The bearing of the TTT is our homage to traditional craftsmanship. The approved construction is known since more than 50 years in the industry, while we have brought the realization and finish to a new level by combining it with traditional knowledge of our watchmaker. The main shaft is made of hard chrome plated carbon tool steel. Its surface has been hand polished step by step with basswood and diamond-paste. The shaft runs in two sintered bronze bushings,

which have been soaked and cooked with specifically made oil. This guarantees maintenance free running for many decades. Vertically, the shaft ends up in a spherical carbide metal piece, lying on a hardened steel ball. The whole bearing is put inside a body made of ductile cast iron. This material has extraordinary damping qualities and keeps away any noise from the main chassis.

Platter



The platter of the TTT has two important tasks: it enlarges the rotating inertial mass and provides the underlay for the record. The complete mass of the platter is 6.5 kg, but by concentrating the rotating mass at the outside diameter, the inertial properties are equal to a massive platter of 8 kg. The platter is tuned to one single resonance frequency and efficiently damped by a customized lead-vinyl inlay. This inlay is at the same time the mat the record is lying on. After choosing the material of the mat by listening tests, we have proved its function by measuring the vibration of the bare platter compared to the damped one. As you can see in the picture above, the – quite high – resonance frequency of the platter (upper curve) is completely damped away with the mat (lower curve). But in all this, the main signal is kept very precise; there is no flattening or blurring, usually known as «overdamping».

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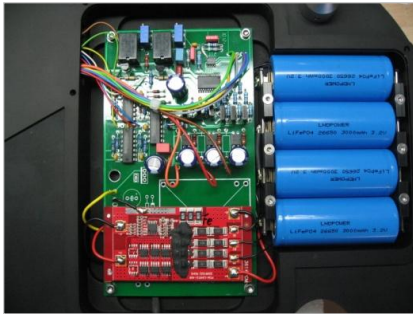
Spikes



The spikes look quite common from outside, but the secret of the decoupling and leveling mechanism is inside. The spikes make the turntable standing on balls, keeping it in position by a small rubber element. This keeps horizontal vibration of the ground away efficiently. The leveling mechanism is a combination of a machined thread with a high precision sliding fit. This makes leveling of the unit easy,

secure and precise, while preventing any play or unstable standing. Depending on the base and environment, we do recommend our air-suspension base Levi-Base.

Electronics



The electronics has been developed especially for our turntable. It is a closed loop controller which keeps the speed of the motor constant. The feedback of the brushless DC-motor is compared with an extreme precise reference voltage, which makes the drive unit significant more accurate than a pll-system with quartz controlled oscillator. The outstanding feature of the TTT-Compact is the battery based power supply with LiFePo accumulators, using nano-technology. The

peak capacity is higher than 1kW while using not one single vibrating element. Therefore it is possible to integrate the power-supply into the main chassis, keep the signal-path short and skip any connection to the power plant. The battery service life is 16 hours, switching between playing- and charging-mode is to be operated manually.

Technical Specifications:

- Turntable speed: 33 1/3 rpm, 45rpm
- Wow and flutter at 33 1/3 rpm, DIN45 507: $\pm 0,06\%$
- Rumble: -60dB (unweighted)
- Output-terminals: RCA / XLR / direct wiring
- Weight: 16 kg
- Size: 432 x 312 x 91mm
- Input voltage for charger: 100-240V, 50-60Hz
- Battery service life: 16h

Turntable Specifications:

- 3-phase motor underneath platter
- Short belt drive system with flywheel
- High-precision bearing, hard chrome-plated
- Lead-vinyl-mat between platter and record
- Decoupling ball element feet
- Integrated drive electronics
- Clamp with lead-vinyl-inlay
- Black finish with silver edges

Options:

- Additional tonearm-base (9" ...12")
- LEVI-Base with air suspension

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